

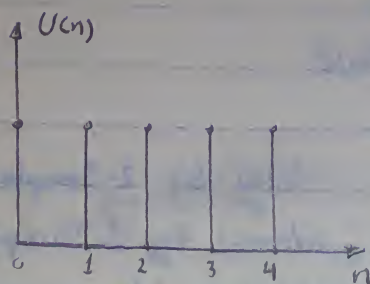
# Digital Signal processing

Report 1

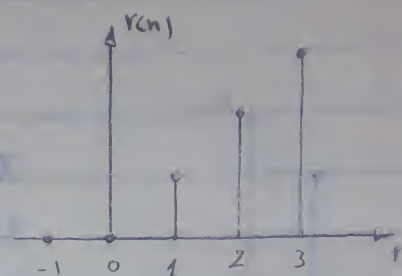
Solution of Q1:

$$\text{Sketch } x(n) = u(n) + r(n-2) - r(n-5) - r(n-8) + r(n-11)$$

Sol<sup>n</sup>



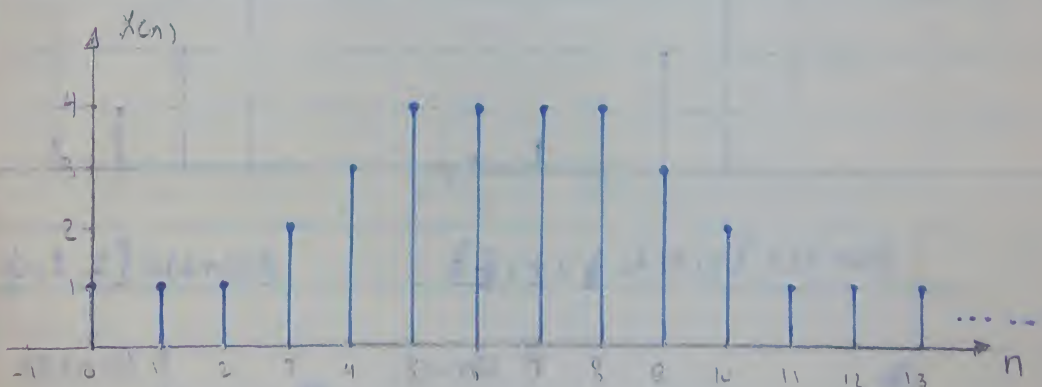
$$u(n) = \begin{cases} 1 & n \geq 0 \\ 0 & n < 0 \end{cases}$$



$$r(n) = \begin{cases} n & n \geq 0 \\ 0 & n < 0 \end{cases}$$

bb

$$\text{For } r(n-k) : r(n-k) = \begin{cases} n-k & n \geq k \\ 0 & n < k \end{cases}$$



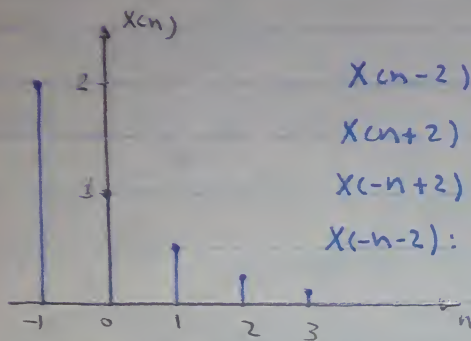
Solution of Q2:

Given  $x(n) = \{2, 1, \frac{1}{2}, \frac{1}{4}, \frac{1}{8}\}$

Find:

- ①  $x(n-2)$       ②  $x(n+2)$       ③  $x(-n-2)$       ④  $x(-n+2)$

Sol<sup>n</sup>

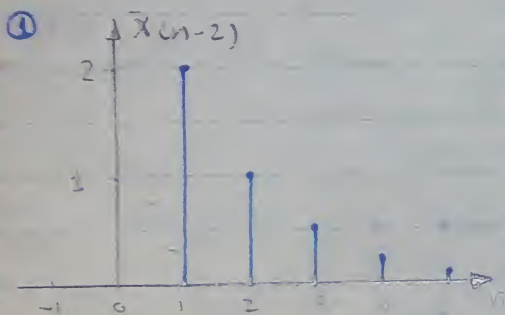


$x(n-2)$  : delay by 2-Samples

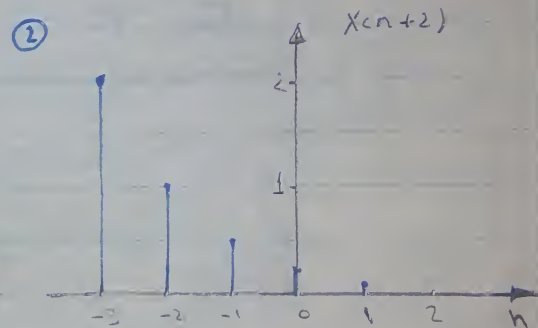
$x(n+2)$  : advance by 2-Samples

$x(-n+2)$  : Fold then delay or advance then fold

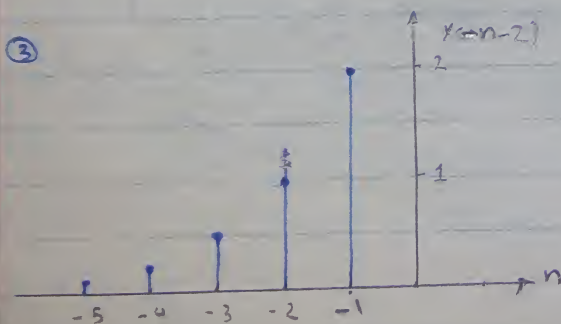
$x(-n-2)$  : Fold then advance or delay then fold



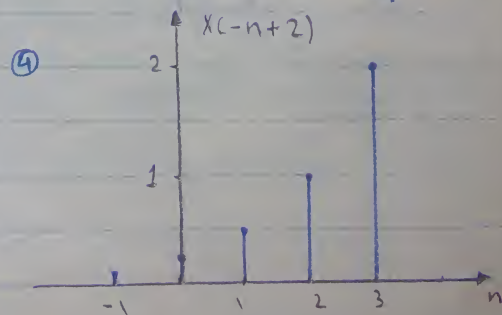
$$x(n-2) = \{0, 2, 1, \frac{1}{2}, \frac{1}{4}, \frac{1}{8}\}$$



$$x(n+2) = \{2, 1, \frac{1}{2}, \frac{1}{4}, \frac{1}{8}\}$$



$$x(-n-2) = \{\frac{1}{8}, \frac{1}{4}, \frac{1}{2}, 1, 2, 0\}$$



$$x(-n+2) = \{\frac{1}{8}, \frac{1}{4}, \frac{1}{2}, 1, 2\}$$